Of Diabetes

#13

Being subjected to the influence of those laws and customs relative to gra-
-duation in this institution; which require that every candidate for a diploma should write a dissertation previous to his exami-
-nation, I have with considerable diffidence undertaken one; which nothing but my pe-
-culiar situation could have induced me to do at this time. For possessed of little or no experience of my own, I am constrained to follow the footsteps of others, which are often-
-times incorrect and for the most part quest-
-ionable. Thus situated all claim to ori-
ginality must necessarily be relinquished, and so far from aiming at it, I have not hesitated occasionally, when I have found it sufficiently clear and familiar for my purpose, to use the language of others.

It was my intention to have written an experimental essay, but press of time and the difficulty of procuring proper subjects obliged me to abandon the idea and choose some practical subject. I have accordingly selected Diabetes, a disease which in common with many others has been subjected to much theory and speculation and like others remains involved in considerable obscurity.

This disease, which Cullen places in the class neuroses, order spasmi, and which has been systematically, but by some supposed unkeply divided or distinguished into Diabetes mellitus wherein the urine is sweet and fragrant, and Diabetes insipidus with limpid urine not sweet, is marked by great thirst, a voracious appetite, accompanied with an apparent defect in the process of chylification, weariness and a disinclination to exertion, emaciation of the

whole body, great debility, dry skin, a parched mouth, with constant spitting of a thick viscid phlegm of a sweetish taste, costiveness, the pulse commonly frequent, an obscure fever being for the most part present, and a frequent voiding of urine, containing a quantity of saccharine matter; which last is the most essential character of the disease; the urine discharged generally far exceeding the quantity of fluid and sometimes aliment introduced, being very clear "and at first sight appears entirely without any colour; but viewed in a certain light, it generally appears to be slightly tinged with a yellowish green; and in this respect it has been very properly compared to a solution of honey in a large proportion of water".

As this disease often arises to a considerable degree, and subsists long without being accompanied with evident disorder in any particular part of the system, the

increased discharge of urine being generally attribu-
-ted by the patient to the quantity of drink
he has taken; there is some difficulty in ascertain-
-ing the first and earliest symptoms of the dis-
-ease, or that state of it, at which the moistness
and increase of the urine takes place; for
the saccharine taste of the urine is frequent-
-ly only discovered by accident. Dr Rollo thinks there
is scarcely a doubt but that an affection of the
stomach exists previous to the formation of
saccharine matter and mentions cases where the
canine appetite preceded, several months, the in-
-crease of the urine, he thinks however, the histo-
-ry of the previous circumstances, and of the im-
-mediate commencement, still requires further
elucidation —

No age or constitution seems to be exempted from
this disease. It occurs in all classes of people, though
probably more generally in the higher and middling

orders, and those whose constitutions have been shat-
-tered by intemperance. Males are said to be more
liable to it than females; although probably this
may not be the case, for its apparently more fre-
-quent occurrence in males, may I imagine rather
be attributed to the extreme delicacy of the
female sex concealing their situation when under
the influence of the disease, than to any peculiarity
of their constitutions exempting them from it. It is proba-
-ble that an hereditary predisposition may exist as to the com-
-plaint; for cases are recorded where several members of the
same family have been affected with it. The progress
of the disease appears to be much influenced by the
various passions of the mind, such as grief ~~agi-~~
-fear &c. as they always aggravate the symp-
-toms.

When Diabetes has been of long continuance,
although the patient may be apparently cured,
yet frequently it leaves behind local affec-

-tions. Dissections have shewn morbid affec-
-tions of the mesenteric glands and kidneys;
and the structure of the stomach, pancreas, spleen,
liver and lungs is sometimes altered.
It appears to be now pretty generally conceded
that Diabetic urine contains a considerable
quantity of saccharine matter, which appears to
be exactly of the same nature as common sugar.
Dr Cullen thinks that he has met with one case
where the urine was perfectly insipid, he seems to con-
-sider such instances very rare, and believes that
the other is almost the universal occurrence. Since
Dr Willis discovered the sweetness of the urine, phy-
-sicians have all more or less observed it.
The immediate cause of Diabetes Mellitus has
always been considered obscure, and various the-
-ories have been advanced on the occasion. I shall
only observe a few of them, and then proceed to men-
-tion the one which appears to me most plausible.

The morbid condition, in which the kidneys are sometimes found on dissection, has induced the majority of physicians to consider Diabetes as depending on a primary affection of those organs, and that it is by virtue of their perverted or deranged action, that the saccharine principle in the urine is produced.

This morbid state, I presume, may be secondary, and referable to that law of the animal economy termed, sympathy, by which their action is increased according to the exigences of the system, and being kept up for any length of time, must necessarily produce more or less disease by the continued stimulus it imparts. They have no agency I believe in the formation of the sugar incident to Diabetic urine; but merely serve to receive it already formed in the stomach, and to throw it out of the system.

Those who favour the idea of the primary cause existing

in the kidneys, have endeavoured to shew the possibility of the sugar being formed by a secretion similar to that which takes place in the breasts of women, which secrete a large amount of saccharine principle in the milk.

The facility and rapidity with which fluids containing different principles, are conveyed to the kidneys; whilst the quality of the urine discharged is so different; has occasioned some to regard those organs as <u>seperating</u>, rather than <u>secreting</u>; and consequently they consider the urine not a <u>product</u> but an <u>educt</u> of the blood. Admitting however this similarity between the action of the mammæ and kidneys, at least so far that each secrete a saccharine principal, yet it has been demonstrated by chemical investigation, that there is an essential difference between the sugar of milk and the saccharine matter in Diabetic urine.

"My
bre
In
an
leg
po
ge
The
an
He
ab
wa
of
H
tea
tal
cr
wh
la

"Two drams of the sugar of milk were dissolved by Brinckshank, in 12 drams of nitric acid, diluted with ℥i of water - this was carefully evaporated, and put to cool; which being done, a crystallized mass formed mixed with a certain white powder - The precipitate weighed about 58 grains. Six drams of boiling water were added. The crystals of oxalic acid were dissolved, and the white powder remained unchanged. This was separated by filtration, and weighed about 10 grains; and by further experiment, was found to possess all the peculiar properties of saccholactic acid.

Two drams of the extract of Diabetic urine were treated at the same time in a similar way; crystals formed, but no white powder appeared. The crystals weighed about 40 grains; and were wholly dissolved in boiling water. No saccholactic acid was produced in this experiment

which was repeated several times on the extract of urine from different Diabetic patients".

It would seem from these experiments of Mr. Brickshank, that the essential difference between the sweet extractive matter of Diabetic urine, and sugar of milk, consists in the former not containing the basis of saccholactic acid. It would also appear from hence that the sugar of milk was produced by a process of animalization; whereas the saccharine principle of Diabetic urine should be regarded, as a vegitable extract, combined with a greater or less proportion of animal mucilage, resembling very much honey, which is not a product of animalization but of vegitables.

A certain state of the bile has been supposed to produce this disease.

It is probable that it has sometimes occurred in persons who were at the same time affected with

des-
mo-
the
ter-
on
L
of
of
ac
an
At
on
ho
pl
ca
N
se
th
a

disease of the liver. But I apprehend that this cannot frequently be the case; for Dr. Cullen observes that in twenty instances which he has seen of Diabetes, there was no evident affection of the liver in any one of them.

Dr. Richter, professor of medicine in the university of Gottingen, supposes Diabetes to be commonly of a spasmodic nature, occasioned by a stimulus acting on the kidneys; hence an increased secretion, "and sometimes perversa" is the consequence.
It is true that irritation may sometimes occasion an increase in the discharge of urine, but how it effects the singular change which takes place in its composition, I imagine cannot easily be accounted for.

No Hypothesis yet advanced seems to prove in a satisfactory manner the primary seat of this disease; but from the weight of evidence and an attentive consideration of all the ci-

-cumstances attending it, I am induced to believe that it is altogether a disease of the stomach. I am led to this opinion, in the first place, from its often attending other diseases of that viscus, such as hysteria, hypocondriasis and dyspepsia; in the second from the voracious appetite, indigestion and costiveness which almost invariably attend it; in the third from its general occurrence in those whose constitutions have been shattered by intemperance, in drinking or other excesses; the effects of which are primarily exerted on the stomach.

Dr Bone in his lecture on Diabetes, read before the class last winter, wherein he appeared to take the correctest views, and supported his opinions with the most conclusive arguments observed that the stomach was to be regarded as the primary seat of the disease; but the saccharine matter is compounded or evolved from vegetable-

substances taken in. Dr Stokes Mellitus he went on to say, appeared to arise from an action of the stomach, morbidly increased, by which a large quantity of gastric liquor was secreted; which also by its morbid nature, seemed capable of decomposing the vegetable matters, and thereby of producing the saccharine principle incident to the disease, in which, vegetables do not appear to undergo the changes that take place in health, but become quickly changed into the saccharine principle.

"In health, an uniform and perfect chyle is prepared, and applied to the salutary purposes of the animal economy. In its composition, sugar appears to be an essential article, but it undergoes the proper changes; whereas in this disease it remains unchanged, producing other morbid affections, besides those on which its undecomposition depends, and is thrown

out by the kidneys, as an extraneous and injurious matter" Wells

The alteration and increase in the secretion of the gastric fluid, appears to be the necessary consequence of the morbid action of the stomach. The great quantities of viscid matter ejected by vomiting in this disease, together with the nature and rapidity of digestion, support the opinion of such an increase in the gastric fluid.

To the formation of saccharine matter, is the explanation of the increase in the quantity of urine principally referable; although from the intimate connection between the stomach and kidneys, we may suppose that independently of the saccharine matter, so long as the increased action of the stomach remain, a preternatural quantity of urine will continue to be discharged.

In addition to the arguments derived from

The
ma
whe
of
-po
of
blo
be
-tro
dis
.ve
lie
bre
Ze
ane
Z
wa
is
up

the disease itself, we have the observations of many practitioners of the highest eminence, which very satisfactorily prove, that the blood of Diabetic patients, contains sugar in its composition - we learn from the experiments of Dr. Dobson that he detected sugar in the blood of persons labouring under Diabetes. In a case of Diabetes which fell under the observation of the late professor Barton, his patient discharged daily large quantities of saccharine matter in his urine. On having him bled and testing the serum of the blood, the presence of sugar was distinctly exhibited. The experiment was repeated several times, and with the same results.

From the facts above related, I imagine I am warranted in the conclusion, that the stomach is the primary seat of the disease; depending upon some change in the natural powers

of digestion and assimilation in these viscera. The food is hereby rendered unfit for the purposes of nutrition, and when taken up by the lacteals, and conveyed to the general circulation; it is rejected by the nutrient powers of the system, and eliminated through the kidneys. The morbid or deranged action of those organs is generated in the efforts of nature, to free the vascular system of that effluex of fluid which is constantly pouring into it through the medium of the lacteals. I therefore again repeat that the diseased appearance of the kidneys is entirely owing to sympathy - by it their action is increased according to the exigences of the system; and being continued for any length of time, will necessarily produce more or less disease by the continued stimulous which it imparts -

It
other
the
-vey
ey
-cu
open
in S
-nec
of e
wes
or H
espe
abor
nor
-cul
-ell
for
-m

It is the opinion of Mr Wallaston and some others that the saccharine principle of Diabetic urine formed in the stomach, is conveyed immediately from thence to the urinary system, without entering the general circulation. The above gentleman was led to that opinion from not being able to detect sugar in Diabetic blood. To confirm which he, in connection with Mr Marcet performed a number of experiments on the Prussic Potash. The question was whether it could be detected in the blood or the secretions, when taken internally. After experimenting several times with the article above mentioned, they concluded that it was not absorbed or taken up into the general circulation, but carried by some unknown vessels from the stomach to the kidneys.

For my own part I am entirely doubtful what opinion to form respecting this immediate connection

between the stomach and kidneys. It is probable however that Mr Wallaston's not detecting the Prussic Potass in the blood proceeded rather from the imperfect state of chymical knowledge, than to its actual absence. The specific difference between marsh miasmata and common atmospheric air, have never yet been discovered; yet all agree that their properties are essentially distinct, and that we only know them by their effects on the system, ignorant of the nature of their agency

I by no means wish it to be understood from hence as my opinion, that substances enter indiscriminately into the circulation unchanged, far from it; I believe, as a general rule that all substances are assimilated previous to their being taken up by the lacteals.

The cure of Diabetes Mellitus is as yet but imperfectly understood. this appears to be

acc
wher
it ca
- mer
the
Cate
than
Dr. C
- tor
with
cape
chu
adv
- by
Bty
to be
than
with
As

acknowledged unanimously. Dr Cullen doubts whether it has ever been cured, or if cured, whether it can be ascribed to the remedies taken. The treatment has been as various as the theories respecting the disease itself. Few remedies according to the late Dr Barton have acquired more reputation than alum in Diabetes. He mentioned a case which Dr Wistar cured by the use of that article. Dr Barton supposed that galls might be substituted with advantage for alum. he had heard of one case cured by the nit: of silver. Dr Haller exhibited rhubarb as a tonic in this disease. Mascagni advised the use of cantharides. Ferriar extols highly a combination of hiosciamus, Bark and opium. Blisters about the region of the kidneys are said to be sometimes serviceable. Dr Barton thought that he had used the Phosphate of soda as a purge with advantage.

As the modes of treatment which have hitherto been

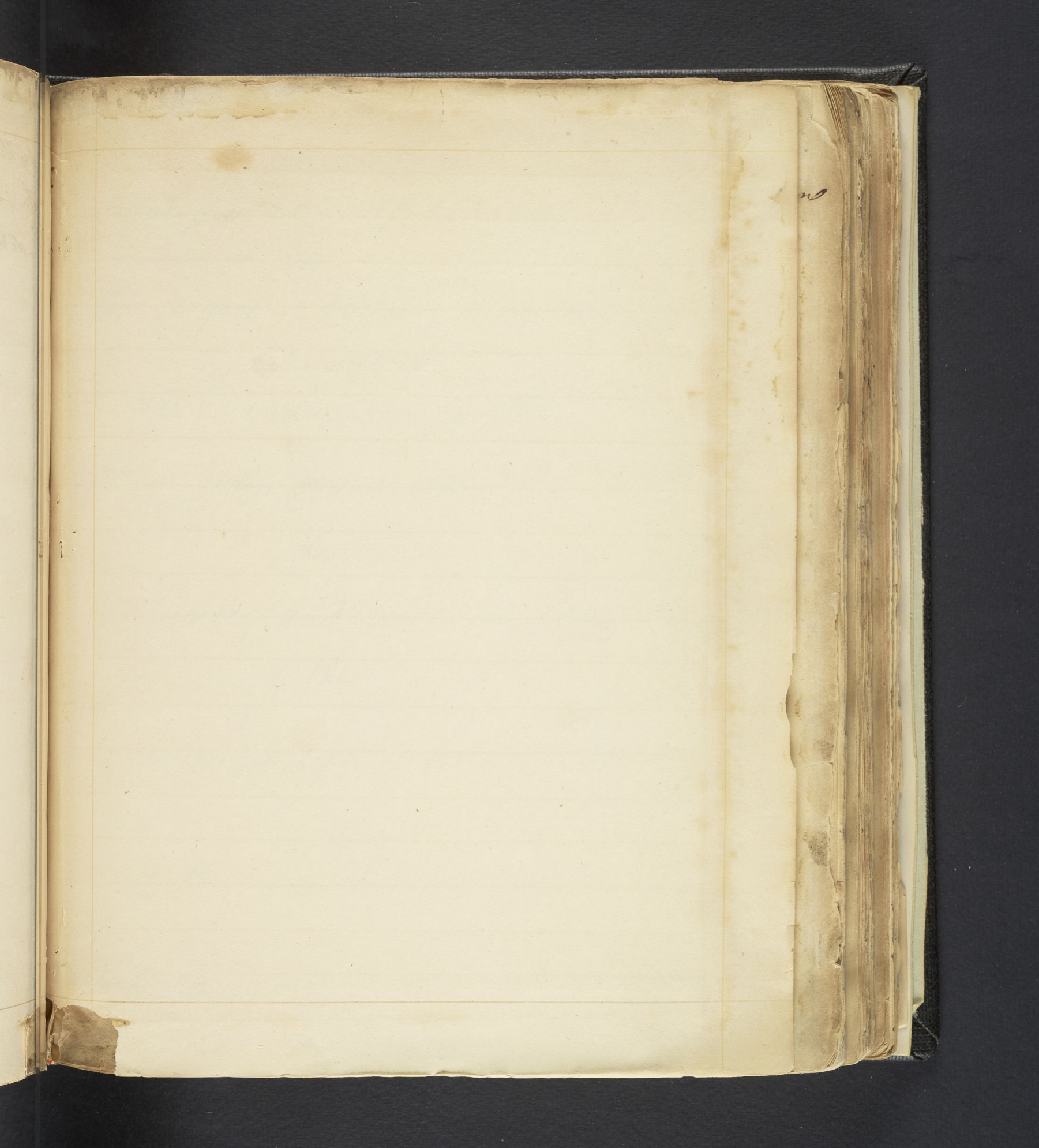
per
feg
me
whe
pes
-tho
-foc
cu
-ne
dis
-tig
per
au
to
on
ap
ne
Ho
de

pursued respecting this disease appear to have been frequently ineffectual. I shall briefly make mention of the plan recommended by Dr Rollo; which according to the view I have given of the proximate cause of Diabetes appears to be best adapted to it, and which is said to have frequently performed cures under the most unfavourable circumstances. Confinement, an entire abstinence from every species of vegetable matter, a diet solely of animal food, with emetics, hepatized ammonia and narcotics, comprehend the principal plan of his treatment; which seem to answer the two indications which he supposes to be 1st to destroy the saccharine process going on in the stomach. 2dly to promote a healthy assimilation, by the removal of the morbidly increased action of that viscus.

This method should be pursued in, until the disease be entirely removed; which is ascertained

by
the
-de

by the removal of the general symptoms, and the return of the urine to a natural con-
-dition.



Ins

The

Re